

**AMENDMENTS TO THE CLAIMS:**

This listing of claims will replace all prior versions and listings of claims in the application:

1. (Currently Amended) A method for addressing packets in a firewall cluster within a single network, the firewall cluster including a plurality of firewall nodes comprising one or more processing units, the method comprising:

selecting, from the firewall cluster within the single network, a first firewall node for processing a first packet;

receiving, at a first processing unit associated with the first firewall node, the first packet;

modifying, by the first processing unit, as a function of a multidimensional n-tuple space for representing addresses processed by a set of processing units, a first address for the first packet into a second address for the first packet, the second address being within a range of addresses assigned only to the first firewall node;

selecting, from the firewall cluster within the single network, a second firewall node for processing a second packet;

receiving, at a second processing unit associated with the second firewall node, the second packet, the second processing unit being different than the first processing unit;

modifying, by the second processing unit, as a function of a multidimensional n-tuple space for representing addresses processed by a set of processing units, a first address for the second packet into a second address for the second packet, the second

address being within a range of addresses assigned only to the second firewall node, such that the second address of the second packet does not conflict with the second address of the first packet;

forwarding the first packet based on the second address of the first packet; and  
forwarding the second packet based on the second address of the second packet.

2. (Cancelled).

3. (Currently Amended) The method of claim [[2]] 1, further comprising:  
assigning to the first processing unit a first region based on the N-tuple space.

4. (Previously Presented) The method of claim 3, further comprising:  
using the first address of the first packet, such that the first address represents a point within the first region.

5. (Original) The method of claim 4, further comprising:  
using N address values as the N-tuple, such that the N address values represent the point.

6. (Currently Amended) The method of claim [[2]] 1, further comprising:  
using the N-tuple space, such that N is equal to a value of at least two.

7. (Previously Presented) The method of claim 3, further comprising:  
assigning to a second processing unit a second region based on the N-tuple space, such that the first region is separate from the second region.

8. (Cancelled).

9. (Cancelled).

10. (Currently Amended) A method for addressing packets associated with a plurality of processing units, each processing unit being associated with one of a plurality of firewall nodes in a firewall cluster within a single network, the method comprising:

selecting, from the firewall cluster within the single network, one of the firewall nodes for processing a packet, the selected firewall node including a first processing unit;

receiving, at the first processing unit, the packet;

reading, at the first processing unit, an N-tuple address of the received packet;

determining, by the first processing unit, whether the N-tuple address of the received packet is within an N-tuple space assigned to the first processing unit based on a quadrant identifier value assigned to the first processing unit, wherein the N-tuple space assigned to each of the plurality of processing units is different, and wherein the quadrant identifier is determined using a hash function;

sending the packet with the N-tuple address, when it is determined that the N-tuple address is within the N-tuple space assigned to the first processing unit;

determining, when the N-tuple address of the received packet is not within the N-tuple space assigned to the first processing unit, a modified N-tuple address based on the N-tuple space assigned to the first processing unit, such that the modified

N-tuple address does not conflict with addresses assigned by any of the other plurality of processing units; and

sending the packet based on the modified N-tuple address.

11. (Original) The method of claim 10, wherein the reading step further comprises:

reading as the N-tuple address, a plurality of values from the received packet.

12. (Original) The method of claim 11, wherein the reading step further comprises:

reading at least a source port.

13. - 15. (Cancelled).

16. (Currently Amended) The method of claim ~~[[14]]~~ 10, wherein the step of determining whether the N-tuple address of the packet is within the N-tuple space, further comprises:

determining the quadrant identifier value based on a hash function and a modulo division.

17. (Previously Presented) The method of claim 10, wherein the step of determining the modified N-tuple further comprises:

adding a value to the N-tuple address, such that the modified N-tuple address is within the N-tuple space assigned to the first processing unit.

18. - 20. (Cancelled).

21. (Previously Presented) The method of claim 10, further comprising:  
using a computer as the first processing unit.

22. (Previously Presented) The method of claim 10, further comprising:  
using a router as the first processing unit.

23. (Cancelled).

24. (Previously Presented) A method of addressing packets in a firewall cluster within a single network, wherein the firewall cluster comprises a set of processing units, each processing unit being associated with a firewall node, the method comprising:

selecting, from the firewall cluster within the single network, one of the firewall nodes for processing a packet, the selected firewall node including a first processing unit;

receiving, at the first processing unit, the packet;

reading, at the first processing unit, an N-tuple address of the received packet;

determining a quadrant identifier based on the read N-tuple address, a hash function, and modulo division;

determining whether the read N-tuple address corresponds to the first processing unit based on the quadrant identifier;

sending the packet with the N-tuple address, when the quadrant identifier corresponds to the first processing unit; and

determining, when the quadrant identifier does not correspond to the first processing unit, a modified N-tuple address that corresponds to the first processing unit, such that the modified N-tuple address does not conflict with addresses assigned by any of the other processing units; and

sending the packet based on the modified N-tuple address.

25. (Previously Presented) The method of claim 24, further comprising:  
assigning each of the set of processing units a firewall node number.

26. (Previously Presented) The method of claim 25, further comprising:  
determining whether the N-tuple address corresponds to the first processing unit based on the quadrant identifier and the firewall node number.

27. (Currently Amended) A system for addressing packets in a firewall cluster within a single network, the firewall cluster including a plurality of firewall nodes, the system comprising:

means for selecting, from the firewall cluster within the single network, a first firewall node for processing a first packet;

means for receiving, at a first processing unit associated with the first firewall node, the first packet;

means for modifying, as a function of a ~~multidimensional~~ n-tuple space for representing addresses processed by a set of processing units, a first address for the first packet into a second address for the first packet, the second address being within a range of addresses assigned only to the first firewall node;

means for selecting, from the firewall cluster within the single network, a second firewall node for processing a second packet;

means for receiving, at a second processing unit associated with the second firewall node, the second packet, the second processing unit being different than the first processing unit;

means for modifying, as a function of a multidimensional n-tuple space for representing addresses processed by a set of processing units, a first address for the second packet into a second address for the second packet, the second address being within a range of addresses assigned only to the second firewall node, such that the second address of the second packet does not conflict with the second address of the first packet;

means for forwarding the first packet based on the second address of the first packet; and

means for forwarding the second packet based on the second address of the second packet.

28. (Currently Amended) A system for addressing packets associated with one or more processing units, each processing unit being associated with a firewall node in a firewall cluster within a single network, the system comprising:

means for selecting, from the firewall cluster within the single network, one of the firewall nodes for processing a packet, the selected firewall node including a first processing unit;

means for receiving, at the first processing unit, the packet;

means for reading, at the first processing unit, an N-tuple address of the received packet;

means for determining whether the N-tuple address of the received packet is within an N-tuple space assigned to the first processing unit based on a quadrant identifier value assigned to the first processing unit, wherein the N-tuple space assigned to each of the processing units is different, and wherein the quadrant identifier is determined using a hash function;

means for sending the packet with the N-tuple address, when it is determined that the N-tuple address is within the N-tuple space assigned to the first processing unit; and

means for determining, when the N-tuple address of the received packet is not within the N-tuple space assigned to the first processing unit, a modified N-tuple address based on the N-tuple space assigned to the first processing unit, such that the modified N-tuple address does not conflict with addresses assigned by any of the other processing units;

and sending the packet based on the modified N-tuple address.

29. (Previously Presented) A firewall cluster within a single network including firewall nodes associated with processing units, comprising:

means for selecting, from the firewall cluster within the single network, one of the firewall nodes for processing a packet, the selected firewall node including a first processing unit;

means for receiving, at the first processing unit, the packet;



means for reading, at the first processing unit, an N-tuple address of the received packet;

means for determining a quadrant identifier based on the read N-tuple address, a hash function, and modulo division;

means for determining whether the read N-tuple address corresponds to the first processing unit based on the quadrant identifier;

means for sending the packet with the N-tuple address, when the quadrant identifier corresponds to the first processing unit; and

means for determining, when the quadrant identifier does not correspond to the first processing unit, a modified N-tuple address that corresponds to the first processing unit, such that the modified N-tuple address does not conflict with addresses assigned by any of the other processing units;

and sending the packet based on the modified N-tuple address.

30. (Currently Amended) A system including a firewall cluster within a single network including a plurality of firewall nodes, the firewall nodes being associated with one or more processing units, said system comprising:

at least one memory comprising:

code that selects, from the firewall cluster within the single network, a first firewall node for processing a first packet, the first firewall node including a first processing unit;

code that receives, at the first processing unit, the first packet;

code that modifies, as a function of a multidimensional n-tuple space for representing addresses processed by a set of data processing units, a first address for the first packet into a second address for the first packet, the second address being within a range of addresses assigned only to the first firewall node;

code that selects, from the firewall cluster within the single network, a second firewall node for processing a second packet; the second firewall node including a second processing unit;

code that receives, at the second processing unit, the second packet, the second processing unit being different than the first processing unit;

code that modifies as a function of a multidimensional n-tuple space for representing addresses processed by a set of processing units, a first address for the second packet into a second address for the second packet, the second address being within a range of addresses assigned only to the second firewall node, such that the second address of the second packet does not conflict with the second address of the first packet;

code that forwards the first packet based on the second address of the first packet; and

code that forwards the second packet based on the second address of the second packet; and

at least one processing unit for executing the code.

31. (Currently Amended) A system including a firewall cluster within a single network including a plurality of firewall nodes, the firewall nodes being associated with processing units, the system comprising:

at least one memory comprising:

code that selects, from the firewall cluster within the single network, one of the firewall nodes for processing a packet, the selected firewall node including a first processing unit;

code that receives, at the first processing unit, the packet;

code that reads, at the first processing unit, an N-tuple address of the received packet;

code that determines whether the N-tuple address of the received packet is within an N-tuple space assigned to the first processing unit based on a quadrant identifier value assigned to the first processing unit, wherein the N-tuple space assigned to each of the processing units is different, and wherein the quadrant identifier is determined using a hash function;

code that sends the packet with the N-tuple address, when it is determined that the N-tuple address is within the N-tuple space assigned to the first processing unit;

code that determines, when the N-tuple address of the received packet is not within the N-tuple space assigned to the first processing unit, a modified N-tuple address based on the N-tuple space assigned to the first processing unit, such that the modified N-tuple address does not conflict with addresses assigned by any of the other processing units;

and sending the packet based on the modified N-tuple address;

and

at least one processing unit for executing the code.

32. (Original) The system of claim 31, wherein code that reads further comprises:

code that reads as the N-tuple address, a plurality of values from the received packet.

33. (Original) The system of claim 32, wherein code that reads the plurality of values further comprises:

code that reads at least a source port.

34. - 36. (Cancelled).

37. (Previously Presented) A firewall cluster including a plurality of firewall nodes within a single network, the firewall nodes being associated with processing units, the firewall cluster comprising:

at least one memory comprising

code that selects, from the firewall cluster within the single network, one of the firewall nodes for processing a packet, the selected firewall node including a first processing unit;

code that receives, at the first processing unit, the packet;

code that reads, at the first processing unit, an N-tuple address of the received packet;

code that determines a quadrant identifier based on the read N-tuple address, a hash function, and modulo division;

code that determines whether the read N-tuple address corresponds to the first processing unit based on the quadrant identifier;

code that sends the packet with the N-tuple address, when the quadrant identifier corresponds to the first processing unit; and

code that determines, when the quadrant identifier does not correspond to the first processing unit, a modified N-tuple address that corresponds to the first processing unit, such that the modified N-tuple address does not conflict with addresses assigned by any of the other processing units;

and

code that sends the packet based on the modified N-tuple address;

and

at least one processing unit for executing the code.

38. (Currently Amended) A computer-readable storage medium comprising instructions which, when executed by a processing unit, perform a method for addressing packets in a firewall cluster within a single network, the firewall cluster including a plurality of firewall nodes, the method including:

selecting, from the firewall cluster within the single network, one of the firewall nodes for processing a packet, the selected firewall node being associated with a first processing unit;

receiving, at the first processing unit, the packet;

reading, at the first processing unit, an N-tuple address of the received packet;  
determining whether the N-tuple address of the received packet is within an N-tuple space assigned to the first processing unit based on a quadrant identifier value assigned to the first processing unit, wherein the N-tuple space assigned to each of the processing units is different, and wherein the quadrant identifier is determined using a hash function;

sending the packet with the N-tuple address, when it is determined that the N-tuple address is within the N-tuple space assigned to the first processing unit; and

determining, when it is determined that the N-tuple address of the received packet is not within the N-tuple space assigned to the first processing unit, a modified N-tuple address based on the N-tuple space assigned to the first processing unit, such that the modified N-tuple address does not conflict with addresses assigned by any of the other processing units; and

sending the packet based on the modified N-tuple address.

39. (Previously Presented) The computer-readable storage medium of claim 38, wherein reading further comprises:

reading as the N-tuple address, a plurality of values from the received packet.

40. (Previously Presented) The computer-readable storage medium of claim 39, wherein reading the plurality of values further comprises:

reading at least a source port.

41. - 43. (Cancelled).

44. (Previously Presented) A computer-readable storage medium comprising instructions which, when executed by a processing unit, perform a method for addressing packets in a firewall cluster within a single network, the firewall cluster including a plurality of firewall nodes, the method including:

selecting, from the firewall cluster within the single network, one of the firewall nodes for processing a packet, the selected firewall node including a first processing unit;

receiving, at the first processing unit, the packet;

reading, at the first processing unit, an N-tuple address of the received packet;

determining a quadrant identifier based on the read N-tuple address, a hash function, and modulo division;

determining whether the read N-tuple address corresponds to the first processing unit based on the quadrant identifier;

sending the packet with the N-tuple address, when the quadrant identifier corresponds to the first processing unit; and

determining, when the quadrant identifier does not corresponds to the first processing unit, a modified N-tuple address that corresponds to the first processing unit, such that the modified N-tuple address does not conflict with addresses assigned by any of the other processing units;

and sending the packet based on the modified N-tuple address.

45. (Currently Amended) A computer-readable storage medium comprising instructions which, when executed by a processing unit, perform a method for addressing packets in a firewall cluster within a single network, the firewall cluster including a plurality of firewall nodes comprising one or more processing units, the method including:

selecting, from the firewall cluster within the single network, one of the firewall nodes within the single network for processing a first packet, the selected firewall node being associated with a first processing unit;

receiving, at the first processing unit, the first packet;

modifying, as a function of a ~~multidimensional~~ n-tuple space for representing addresses processed by a set of data processing units, a first address for the first packet into a second address for the first packet, the second address being within a range of addresses assigned only to the selected firewall node;

selecting, from the firewall cluster within the single network, a second firewall node for processing a second packet;

receiving, at a second processing unit associated with the second firewall node, the second packet, the second processing unit being different than the first processing unit;

modifying, by the second processing unit, as a function of a ~~multidimensional~~ n-tuple space for representing addresses processed by a set of processing units, a first address for the second packet into a second address for the second packet, the second address being within a range of addresses assigned only to the second firewall node,



such that the second address of the second packet does not conflict with the second address of the first packet;

forwarding the first packet based on the second address of the first packet; and

forwarding the second packet based on the second address of the second packet.